Amendment to the Claims:

This listing of claims replaces all prior versions, and listings, of claims in the application:

1-154. (Canceled)

155. (Original) A device for optically measuring a sample, comprising:

a waveguide, which supports at least an input propagation mode of light, to receive and guide an input beam in the input propagation mode;

a probe head coupled to the waveguide to receive the input beam and to reflect a first portion of the input beam back to the waveguide in the input propagation mode and direct a second portion of the input beam in the input propagation mode to a sample, the probe head collecting reflection of the second portion from the sample and exporting to the waveguide the reflection as a reflected second portion in the input propagation mode; and

a detection module to receive the reflected first portion and the reflected second portion in the input propagation mode from the waveguide and to extract information of the sample carried by the reflected second portion.

156. (Original) The device as in claim 155, wherein the detection module comprises:

a beam splitter to split received light into a first beam and a second beam;

a first optical path to receive the first beam;

a second optical path to receive the second beam;

a beam combiner optically coupled to the first and the second optical paths to combine the first and second beams and

to split the combined beam into a first output beam in a first propagation mode and a second output beam in a second propagation mode;

a first optical detector to receive the first output beam; and

a second detector to receive the second output beam.

157. (Original) The device as in claim 156, wherein the detection module comprises a variable optical delay element in the second optical path to adjust a relative delay between the first and the second beams at the beam combiner.

158. (Original) The device as in claim 156, wherein the beam combiner is a polarization beam splitter and the first and the second propagation modes are two orthogonal polarization modes.

159. (Original) The device as in claim 155, wherein the optical probe head comprises an optical partial reflector which reflects the first portion of the input beam back to the waveguide.

160. (Original) The device as in claim 155, further comprising a tunable optical filter in an optical path of light to tune the frequency of the first and second output beams to measure the sample with a spectral bandwidth of the filter.

161. (Original) The device as in claim 155, further comprising a positioning mechanism coupled to adjust a relative lateral position between the optical probe head and the sample to direct the second portion to reach different locations on the

sample to obtain information of the sample at the different locations.

162. (**New**) The device as in claim 155, wherein the waveguide is a polarization maintaining fiber that maintains optical polarization of guided light at a particular optical polarization, and the input propagation mode is an optical mode that is polarized in the particular optical polarization of the polarization maintaining fiber.

163. (**New**) A method for optically measuring a sample, comprising:

directing probe light via an optical waveguide in an input propagation mode to a vicinity of a sample under measurement;

directing a first portion of the probe light to propagate away from the sample at the vicinity of the sample without reaching the sample back into the optical waveguide while maintaining the first portion of the probe light in the input propagation mode;

directing a second portion of the probe light in the input propagation mode to the sample;

directing reflected light from the sample caused by illumination of the second portion to propagate in the input propagation mode to overlap with the first portion at a location where the first portion is generated and to co-propagate with the first portion along the optical waveguide beginning at the location; and

processing the reflected light from the sample and the first portion that co-propagate in the optical waveguide to obtain measurements of the sample at different depths that are reached by the second portion.

164. (**New**) The method as in claim 163, wherein the optical waveguide is a polarization maintaining fiber that maintains optical polarization of guided light at a particular optical polarization, and the input propagation mode is an optical mode that is polarized in the particular optical polarization of the polarization maintaining fiber.

165. (**New**) The method as in claim 163, comprising adjusting a lateral position of a beam spot of the second portion on the sample to direct the second portion to different locations on the sample to obtain measurements of the sample at different depths of the sample at the different locations.

166. (**New**) The method as in claim 165, further comprising forming a measurement image of the sample from the measurements of the sample at different depths of the sample at the different locations.

167. (**New**) The method as in claim 166, comprising obtaining measurements of the sample at different depths at different wavelengths of the guided light to measure a spectral distribution of the responses of the sample at each beam position of the second portion.

168. (**New**) The method as in claim 167, comprising:

using a broadband light source to produce the probe light with a spectral range covering the different wavelengths; and

filtering the probe light to select light at one of the different wavelengths to reach the sample.

169. (**New**) The method as in claim 167, comprising:

using a broadband light source to produce the probe light with a spectral range covering the different wavelengths;

directing light at all wavelengths within the spectral range to the sample without optical filtering; and

subsequent to directing reflected light from the sample to overlap with the first portion at the location and to co-propagate with the first portion along the common optical path, performing an optical filtering to obtain measurements of the sample at different depths at different wavelengths.

170. (**New**) The method as in claim 163, comprising:

separating light from the input optical waveguide that is formed by the first portion and the reflected light into a first light beam and a second light beam;

subsequently varying a relative phase delay between the first light beam and the second light beam;

subsequent to varying the relative phase delay, combining the first light beam and the second light beam to produce combined light; and

detecting and processing the combined light to obtain measurements of the sample at different depths corresponding to different relative phase delays caused by varying the relative phase delay.

171. (**New**) A device for optically measuring a sample, comprising:

a waveguide to receive and guide an input beam in an input propagation mode;

a probe head coupled to the waveguide to receive the input beam and to reflect a first portion of the input beam back to the waveguide in the input propagation mode and direct a second

portion of the input beam to a sample, the probe head configured to overlap reflection of the second portion from the sample with the first portion and to export to the waveguide the reflection as a reflected second portion in the input propagation mode;

a beam splitter to separate light having the first portion and the reflected second portion from the waveguide into a first light beam along a first optical path and a second light beam along a second optical path;

a variable optical delay element in one of the first and the second optical paths to cause a variable relative phase delay between the first light beam and the second light beam; and

a beam combiner to combine the first light beam and the second light beam to produce combined light and to split the combined light into a first optical signal and a second optical signal;

a first optical detector to receive the first optical signal;

a second optical detector to receive the second optical signal; and

an electronic unit to receive and process outputs from the first and the second optical detectors to extract information of the sample carried by the reflected second portion.

172. (**New**) The device as in claim 171, wherein the optical probe head comprises a partial reflector that reflects the first portion of the input beam back to the waveguide, transmits the second portion of the input beam to the sample and collects the reflected second portion to overlap with the first portion at the partial reflector.

173. (**New**) The device as in claim 171, comprising a mechanism to adjust a lateral position of a beam spot of the second portion on the sample to direct the second portion to different locations on the sample to obtain measurements of the sample at different depths of the sample at the different locations.

174. (**New**) The device as in claim 171, comprising:

a light source to produce the input beam with a spectral range covering different wavelengths; and

a tunable optical filter placed in an optical path of the input beam to filter the input beam to have a center wavelength at any one of the different wavelengths, wherein the second portion that reaches the sample is at the center wavelength of the tunable optical filter,

wherein the electronic unit operates to process measurements of the sample at the different wavelengths to obtain a spectral distribution of the responses of the sample at each beam position of the second portion.

175. (**New**) The device as in claim 171, comprising:

a light source to produce the input beam with a spectral range covering different wavelengths, wherein the second portion that reaches the sample has light at the different wavelengths; and

a tunable optical filter placed in an optical path of the first portion and the reflected second portion output by the probe head to filter light of both the first portion and the reflected second portion to have a center wavelength at any one of the different wavelengths,

wherein the electronic unit operates to process measurements of the sample at the different wavelengths to

measure a spectral distribution of the responses of the sample at each beam position of the second portion.